

**Mucool Test Area**  
**List of instrumentation for the cryo-system**

Function	Manufacturer	Price
<b>Pressure safety valve</b>		
LH2 loop safety # 1	AGCO	100
LH2 loop safety # 2	AGCO	100
Hydrogen tank relief	AGCO	100
LH2 supply circuit	AGCO	100
Purification circuit	AGCO	100
Cold trap relief valve	AGCO	100
<b>Pneumatic valve</b>		
Main LH2 supply	Herion	310
Insulating vacuum TMP gate valve	Vacuum one	3415.5
Vacuum control	Herion	310
LH2 loop control	Herion	310
LH2 pump insulating vacuum	Herion	310
LH2 tank flow control	Herion	310
Flow control before purificator	Herion	310
Flow control purificator	Herion	310
Pumping controlled	Herion	310
Pump shut off valve	Herion	310
Flow control after purificator	Herion	310
<b>Electrical valve</b>		
Main LH2 supply	Herion	0
Insulating vacuum pump	Vacuum one	0
Insulating vacuum control	Herion	0
LH2 loop control	Herion	0
LH2 pump insulating vacuum	Herion	0
LH2 tank flow control	Herion	0
Flow control before purificator	Herion	0
Flow control purificator	Herion	0
Pumping controlled	Herion	0
Pump shut off valve	Herion	0
Flow control after purificator	Herion	0
<b>Temperature controlled valve</b>		
LN2 supply	Badger meter	1525
<b>Manual valve</b>		
LH2 pressure measurement purge valve	Swagelock	116.95
LH2 pressure measurement valve	Swagelock	116.95
Insulation vacuum pump purge	Swagelock	116.95
LH2 buffer valve	Swagelock	116.95
LH2 buffer purge	Swagelock	116.95
LH2 pump vacuum purge	Swagelock	116.95
Nitrogen supply purge upstream	Swagelock	116.95
Nitrogen supply purge downstream	Swagelock	116.95
Nitrogen for LH2 pump motor cooling	Swagelock	116.95
Tank gas H2		0
Upstream Nitrogen purge	Swagelock	116.95
Flow control post excess valve	Swagelock	116.95
Purge vent line	Swagelock	116.95
Purificator upstream	Swagelock	116.95
Purificator purge	Swagelock	116.95
Nitrogen purge upstream	Swagelock	116.95
Cold trap inlet valve	Swagelock	116.95

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<b>Manual valve</b>		
Cold trap bypass valve	Swagelock	116.95
Cold trap purge valve	Swagelock	116.95
Cold trap outlet valve	Swagelock	116.95
Pressure measurement valve	Swagelock	116.95
Purge pressure measurement	Swagelock	116.95
<b>Check valve</b>		
Thermal shield	Swagelock	67.8
LH2 pump motor cooling	Swagelock	67.8
Purge nitrogen supply	Swagelock	39.7
Insulation vacuum control	Swagelock	39.7
Hydrogen vent	Swagelock	67.8
Nitrogen purge	Swagelock	67.8
hydrogen vent	Swagelock	67.8
Nitrogen purge	Swagelock	67.8
<b>Regulator</b>		
PCV N2 pressure supply	Matheson	409
LH2 pump motor cooling upstream	Matheson	409
LH2 pump motor cooling downstream	Matheson	409
Source trak/ pig tail	Matheson	2724
Flow control after EFV	Matheson	409
Nitrogen tank purge regulator	Matheson	409
<b>Excess flow valve</b>		
Excess flow valve for H2 circuit	Swagelock	372.1
<b>Pressure Indicator</b>		
PCV N2 pressure supply regulator inlet	Swagelock	0
PCV N2 pressure supply regulator outlet	Swagelock	0
LH2 buffer pressure	Swagelock	25.44
LH2 pump motor insulation vacuum # 1	Swagelock	25.44
Regulator tank # 3 upstream	Matheson	0
Regulator tank # 3 downstream	Matheson	0
Regulation after EFV upstream	Matheson	0
Regulation after EFV downstream	Matheson	0
Regulator nitrogen purge tank upstream	Matheson	0
Regulator nitrogen purge tank downstream	Matheson	0
Pump vacuum	Swagelock	0
LH2 circuit Pressure measurement	Swagelock	0
<b>Pressure Transducer</b>		
LH2 inlet pressure	Barton	667.2
Cryostat insulation vacuum # 1-Penning	Leybold	546
Cryostat insulation vacuum # 2-Pirani	Leybold	176
LH2 buffer pressure	Barton	667.2
LH2 pump motor cooling insulating pressure	Leybold	176
LH2 absorber inlet	Barton	667.2
Pump vacuum	Leybold	176
LH2 circuit Pressure measurement	Barton	667.2
<b>Flowmeter</b>		
Turbine flowmeter	MKS	700

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<b>Differential pressure transducer</b>		
LH2 pump motor insulation vacuum #2	Barton	657.6
LH2 pump differential pressure	Barton	657.6
LH2 absorber differential pressure	Barton	657.6
<b>Temperature Indicator</b>		
HX inlet (Vapor Pressure Thermometer-He)	Barton	667.2
HX outlet (Vapor Pressure Thermometer-He)	Barton	667.2
LH2 pump motor cooling temperature (platinum)	Lake Shore	69
Thermal shield inlet (platinum)	Lake Shore	69
Thermal shield outlet (platinum)	Lake Shore	69
LH2 Pump inlet (Cernox)	Lake Shore	161
LH2 Pump outlet (Cernox)	Lake Shore	161
LH2 Absorber inlet (Cernox)	Lake Shore	161
LH2 Absorber outlet (Cernox)	Lake Shore	161
LH2 HX inlet (Vapor Pressure Thermometer)	Barton	667.2
LH2 HX outlet (Vapor Pressure Thermometer)	Barton	667.2
LH2 buffer level upper (Cernox)	Lake Shore	161
LH2 buffer level lower (Cernox)	Lake Shore	161
<b>Level Transducer</b>		
LH2 buffer level indicator	AMI	725
<b>Heater</b>		
LH2/He HX power #1	Acrolab	53.94
LH2/He HX power #2	Acrolab	53.94
LHe refrigeration		
<b>Current Transmitter</b>		
Current controller	Yaskawa	0
<b>Flowmeter</b>		
Purge system	FNAL	0
Motor cooling system	FNAL	0
Thermal shield colling system	FNAL	0
<b>Equipment list</b>		
Turbo molecular // forepump		14036
Rough. pump ins. Vac.	Leybold	6332
Rough. pump LH2 vacuum	Leybold	
Accessory pump	Leybold	5106
	FNAL	
Electro-pneumatic tranducer	Fairchild	499.55
Temperature sensor Monitor	Lake Shore	1553
Temperature sensor Monitor	Lake Shore	1553
Level transducer controller	AMI	995
Coax. Cable		24
coax cable transmitter		18
2 way BNC		600
Fuji controllers for heaters		290.4
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<b>Total cost</b>		<b>59162.3</b>

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